CSci 1500 – Group Assignment 1 - 100 pts

Due Date: Sept 19, 2019

Part 1

Write a ***detailed* pseudocode** solution for each of the following problems to be solved using a computer. For information on and examples of pseudocode, refer to the document “*Program Design and Pseudocode*” posted on D2L - your pseudocode designs should be similar to the pseudocode examples shown in that document. Design your solutions to produce the program output like that given for each of the problems. Note: Your program should work correctly for any valid user input, not just for the example user input given.

**What you need to turn in:** A printed copy of your pseudocode for each of the problems given below, arranged in order, and stapled together. Include each name of the group on the front page of your pseudocode. Clearly identify which pseudocode solves which problem. Use simple text editor to write and print your pseudocode.

1. Write a program to determine the number of laps a jogger needs to jog on an indoor track based on the number of miles the jogger wishes to jog. Assume that the track is 1/14 mile long. The program should prompt the user to enter the number of miles she wishes to jog, read this number, and then calculate and display the number of laps the jogger needs to jog to cover that mileage. You should assume that the number of miles entered will be a positive integer value. Here is what output should look like from running the program (user input is shown in bold):

Enter number of miles to jog: **4**

You need to jog 56 laps.

1. Write a program that will compute the surface area and the volume of a box. The program should prompt the user to enter the length, width, and height of the box (all in inches), read these numbers, and then calculate and display the box surface area and volume. Note: Box surface area = 2(*lw* + *lh* + *wh*) and box volume = *lwh*, where *l* = box length, *w* = box width, and *h* = box height. You should assume that the box length, width, and height entered will be positive integer values. Here is what output should look like from running the program (user input is shown in bold):

Enter box length, width, and height (inches): **6 2 9**

Box surface area = 168 square inches

Box volume = 108 cubic inches

1. Write a program that converts an input number of quarters, dimes, nickels, and pennies into a dollar total. First, for each of the coin denominations, the program should prompt the user to enter the number of that coin and then read that number. Then, the program should calculate and display the coin counts and the total coin value in dollars. You should assume that the coin counts entered will be non-negative integers. But, note that the total coin value will be a floating point value. Here is what output should look like from running the program (user input is shown in bold):

Enter number of quarters: **2**

Enter number of dimes: **3**

Enter number of nickels: **5**

Enter number of pennies: **4**

2 quarters, 3 dimes, 5 nickels, and 4 pennies = $1.09

1. Write a program that converts a measurement given in feet into the equivalent number of (a) yards, (b) inches, (c) centimeters, (d) meters. The program should first prompt the user to enter the number of feet to be converted. It should then read that value, calculate each of the converted lengths, and then display the converted lengths, rounded to two decimal places of accuracy. You should assume that the number of feet entered will be a floating point value. Note: All the converted lengths will also be floating point values. Conversion facts: 1 yard = 36 inches; 1 foot = 12 inches; 1 inch = 2.54 cm; 1 meter = 100 cm. Here is what output should look like from running the program (user input is shown in bold):

Enter number of feet: **4**

= 1.33 yards

= 48 inches

= 121.92 cm

= 1.22 meters

1. Write a program that converts a liquid measurement given in ounces into the equivalent measurement given in quarts and ounces. The program should first prompt the user to enter the total ounces amount, read the number in, and then convert and display what that total ounce amount is equal to in quarts and ounces. You should assume that the number of total ounces entered will be a positive integer. Note that the number of quarts and remainder ounces will also be integer values. Conversion fact: 1 quart = 32 ounces. Here is what output should look like from running the program (user input is shown in bold):

Enter number of ounces: **68**

68 oz. = 2 qt. 4 oz.

**Hint:** Make use of the integer division and modulus operators.

**Part 2**

Using the pseudocode you developed for each of the problems given in Part 1, write complete C++ programs for each of the problems. Here are the things you need to do for each problem:

· Convert your pseudocode into C++ code. Follow the coding guidelines in the textbook. Remember to use appropriate data types for all variables. Remember to include each name of your group in a comment at the top of the program.

· Save your source code – use a descriptive filename so that you remember what is what. When working on campus, save the file to the C:\CSCI1500 folder and then when you are done, copy the saved source code (i.e., the .cpp file) to your flash stick.

· Compile and run the program and verify that it works properly.

· Print out the source code.

What you need to turn in: A printed copy of your C++ source code for each of the problems, arranged in order, and stapled together. Include each name of your group on the front page of your print-outs. Clearly identify which print-out solves which problem.